



2011 Annual Performance Report Summer of Innovation (SoI)

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PROJECT DESCRIPTION

In 2009, President Obama announced the “Educate to Innovate” campaign to foster a renewed commitment to strengthen America’s literacy in Science, Technology, Engineering, and Math (STEM). In January 2010, National Aeronautics and Space Administration Administrator Charles F. Bolden announced the Summer of Innovation as NASA’s response to a national need for improvement in science, technology, engineering and mathematics, or STEM, education. The Summer of Innovation strategically partners with summer and other out-of-school time (OST) programs to build the capacity of school- and community-based organizations; tailors NASA support to address local needs, and facilitates the infusion of NASA content into summer and OST learning.

This solicitation-driven project supports student interest in STEM by strengthening the capacity of community- and school-based organizations that inspire and engage middle school students in STEM content during the summer. SoI then continues to support follow-on and extended learning efforts designed to keep students involved in NASA-themed STEM activities during the academic year. In 2011, NASA utilized three types of solicitations – cooperative agreements, NASA Field Center intramural call, and mini-grants to implement SoI.

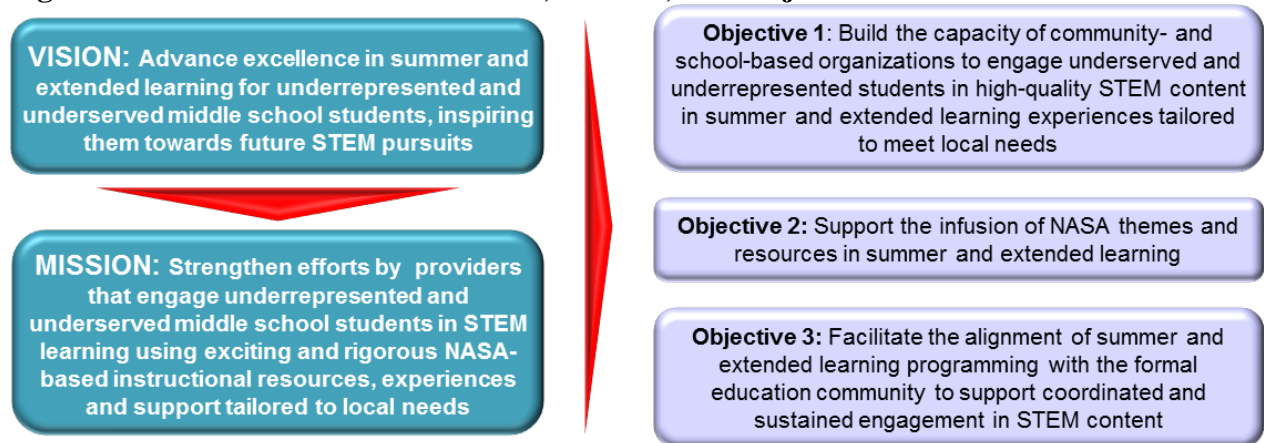
The project will expand both the breadth and depth of school- and community-based partners’ ability to provide meaningful, educational and exciting STEM experiences to students in grades 4-9 who traditionally have been underrepresented in STEM fields. SoI will leverage NASA funding, content, and brand association in partnership with proven school- and community-based summer and extended learning STEM organizations to support projects that are seeking to strengthen current STEM education.

NASA has refined its approach for the Summer of Innovation in 2011 to facilitate the alignment of summer and extended learning programming with the formal education community by aligning summer content offerings with the local needs of schools and providing sustained professional development to certified educators in support of more

effective content delivery. SoI will seek to build the capabilities of those summer and extended-learning STEM program models that are viable for replication or scalability of student interventions.

As can be seen in the Figure I, SoI's clearly articulated Vision, Mission and Objectives are centered on building local educational capacity for supporting STEM education for underserved and underrepresented middle school students.

Figure I: Summer of Innovation Vision, Mission, and Objectives



PROJECT BENEFIT TO OUTCOME 2

Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers and faculty.

The goals of the SoI Pilot Project align to Outcome 2 of the 2006 NASA Education Strategic [Coordination Framework](#), working to “attract and retain students in STEM disciplines.” SoI also supported the following objectives also aligned to Outcome 2:

Objective 2.1—Short Duration Professional Development

Provide short duration professional development and training opportunities to educators, equipping them with the skills and knowledge to attract and retain students in STEM disciplines.

Objective 2.2—Long Duration Professional Development

(Educate) Provide long-duration and/or sustained professional development training opportunities to educators that result in deeper content understanding and/or competence and confidence in teaching STEM disciplines.

Objective 2.3—Curriculum Support Resources

(Educate) Provide curricular support resources that use NASA themes and content to:

- a) Enhance student skills and proficiency in STEM disciplines (Educate);*
- b) Inform students about STEM career skills and proficiency in STEM career opportunities (Engage); and*

c) Communicate information about NASA's mission activities (Engage).

Objective 2.4—Student Opportunities

(Engage) Provide K-12 students with authentic first-hand opportunities to participate in NASA mission activities, thus inspiring interest in STEM disciplines and careers; and/or provide opportunities for family involvement in K-12 student learning in STEM areas.

In FY 2011, the SoI Project contributed to Outcome 2 and its objectives with the following accomplishments:

PROJECT ACCOMPLISHMENTS

- Implemented research based summer programming aligned to the organizational capability of providers
 - Eight National Awards
 - Ten Center awards which partnered with more than 130 organizations and school districts and
 - Mini-Grant awards distributed to 189 organizations
- Substantially increased the number of hours of SoI content and activities as compared to the FY2010 Pilot
 - Targeted forty hours of professional development for educators with a targeted focus on certified teachers
 - Targeted forty hours for students in summer
- Provided professional development and support to 3,773 educators (2,878 certified teachers and 895 informal educators) in SoI STEM content or activities
- Served **40,099** middle school students in grades 4-9 representing a 76% increase from the SoI Pilot in FY2010
- Reached targeted audience (underserved and underrepresented students):
 - 77% minority
 - 46% female
 - 65% received free/reduced lunch

Table I: FY2011 Summer of Innovation Project Participant Data

Participants	Students	Educators (Certified Teachers & Informal Educators)
2011 National Awardees (8)	12,287	*853
**Mini-Grant Awardees	4,845	1,474
Center Awards (10)	17,434	833
***STEM Learning Community Activities	5,533	613
Totals	40,099	3,773

* National Awardee certified teachers only (informal educators will be reported in December 2011)

** Participant data only represents 55 out of 189 awards which completed operations by September 2011

***Participants served by FY2010 national awardees and FY2010 contract award in FY2011

Table II: FY2010 Summer of Innovation Pilot Project Participant Data

Participants	Students	Educators (Certified Teachers & Informal Educators)
National Awardees (4)	4,635	436
Contract Award	4,103	288
Center Awards (10)	14,035	2,791
Totals	22,773	4,083

In 2011 national awardees engaged in cost sharing and external partnerships to implement Summer of Innovation programming. These collaborations range from in-kind use of space to significant funding contributions from state departments of education, US Department of Education 21st Century Community Learning Center grants or charitable giving from businesses and foundations for teacher training or student programming. The majority of Center based collaborations leveraged existing programming and infrastructure, and provided significant technical support and small scale seed funding to create new local or regional STEM efforts or strengthen existing models.

PROJECT CONTRIBUTIONS TO ANNUAL PERFORMANCE GOALS (APGs)

The SoI Project supported the following Fiscal Year 2011 Annual Performance Goals (APGs):

Table III: NASA Office of Education APGs Supported by SoI

APG #	APG Description	SoI Contribution
3	75,000 educators participate in NASA education programs	3,773 educators (certified teachers and informal educators) participated in professional development opportunities offered by the SoI Project
5	600,000 elementary and secondary students participate in NASA instructional and enrichment activities	40,099 middle school students in grades 4-9 participated in the SoI Project
6	75 percent of elementary and secondary students express interest in STEM careers following their involvement in NASA education programs	* 80% of respondents to OEPM surveys expressed interested in STEM careers after participating in SoI
7	5,000 educators use NASA resources in their curricula after participating in NASA professional development	** 2,282 educators used NASA resources in their curricula after participating in NASA professional development

* Result from NASA Office of Education Performance Measurement (OEPM) student surveys. OEPM student surveys were completed by 2246 students participating in NASA Field Center SoI activities. Additionally, an OMB approved student evaluation survey was used to collect self-reported data in support of this APG. The complete analysis of this data and final report from the SoI third party evaluator is scheduled for December 2011. In this report, the third party evaluator will present values for three overarching student constructs (i.e., attitude towards science, career interest in science, and leisure interest in science) calculated by averaging responses to individual items related to the construct's measure, given that a minimum threshold of the items had non-missing data and that items are sufficiently inter-correlated.

** Represents certified teachers and informal educators which were verified by September 21, 2011 (Note: an additional 1446 educators who participated in NASA professional development plan to use resources in their curricula during the 2011-2012 academic year).

IMPROVEMENTS MADE IN THE PAST YEAR

As part of the project redevelopment a comprehensive literature review and benchmarking study was conducted including over 25 interviews with leading summer learning researchers, policymakers, professional organizations, project designers and funders. The promising practices identified through this approach along with the lessons learned from the pilot became the basis of project requirements for 2011 SoI project model. The 2011 SoI project model was designed to increase interest in STEM among student participants, while providing an experience that could potentially support student

achievement gains by incorporating many characteristics of promising programs that target student academic achievement. The project design also aligns with the suggestions of the Report from the President's Council of Advisors on Science and Technology, which encourages a federal role in building capacity of existing after-school and summer programs to inspire interest in STEM by providing educator training and content, addressing needs of individual communities and students, supporting partnerships between programs and nonprofits, and targeting underrepresented students.¹ What makes Summer of Innovation special among the many federal STEM programs is that it leverages NASA's unique resources, such as NASA's mission-inspired content, subject matter experts, and other exciting offerings, to inspire middle school students *as only NASA can*. SoI assists schools and organizations to inspire and support youth by involving them in exciting and challenging learning opportunities based on NASA's unique mission of research and discovery. Additionally, one of SoI's goals is to strengthen ties between informal and formal education communities, which the National Academies suggests may improve academic outcomes because it leads to extended, complementary content experiences.²

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

The Summer of Innovation is a solicitation-driven model. It has a tiered implementation and award approach that provides a continuum of coordinated services to programming providers so that they can engage students in meaningful STEM learning experiences during summer and the school year. SoI provides different amounts of funding and support to organizations based on their past performance, size, and potential student and teacher reach. Summer of Innovation 2011 is implemented across the following four implementation approaches as described below.

National Awards: National Awards support major efforts to build the capacity of high quality or promising educational organizations targeting underserved and underrepresented populations. These National Awards are intended to broaden the scale of successful STEM efforts and/or to deepen the educational content value for organizations that already have a broad student reach by providing them with rich NASA-based STEM curriculum and professional development.

Center Awards: NASA Field Centers have extensive experience engaging local community partners in summer programming for students across the country. Center Awards enhanced SoI's ability to support NASA STEM programming through Centers' collaborations with individual organizations or consortiums that benefited from the use of Centers' resources, facilities, and personnel. The participation of Centers is integral not only to expanding the geographic reach of SoI, but to ensuring that NASA resources are available and accessible to program implementers with a history of successful collaborations with NASA.

¹ President's Council of Advisors on Science and Technology, 2010

² Bell, P., Lewenstein, B., Shouse, A., & Feder, M. (2009). *Learning Science in Informal Environments: People, Places, and Pursuits*. Washington, DC: The National Academies Press.

Mini-Grants: During the pilot of the SoI project in 2010, numerous organizations expressed interest in partnering with NASA in Summer Learning. Many of the organizations that provide opportunities to the SoI target audience are community based, and do not have substantial experience in government partnerships. NASA used the mini-grant opportunity to focus on these smaller organizations across the country to introduce them to Summer of Innovation content and themes. In partnership with the National Space Grant Foundation, SoI awarded mini-grants to various sites across the country.

General Public: Organizations that are not awarded financial support or could not meet the project funding or sustained engagement requirements still had full access to the project's educational content through the SoI website (<http://www.nasa.gov/soi>). Through the Summer of Innovation website, visitors have access to NASA content modules, individual student lessons for grades 4-9, educator training modules, and information regarding alignment to National Standards.

Table IV: Overview of 2011 SoI Model Requirements

Award Characteristic	National Award	Center Collaboration	Mini-Grant Award
Procurement Process	<i>Cooperative Agreement Notice</i>	<i>Project Commitment Agreement</i>	<i>Mini-Grant Application</i>
Targeted Organizations	Large Proven Providers of Content to Target Audience or School Districts	Small to Mid-Size Organizations with interest in enhancing STEM Offerings	Small and Non-Traditional NASA Audiences
Number of Awards/Collaborations in 2011	8	137	Up to 200
Performance Period	48 Months	9 Months	Short Duration
Anticipated Student Yield	20,000 (min. of 2500 students per award)	15,000+	Variable (Est. 10,000)
Total Hours of Annual Summer Engagement Per Student	Min. 40 Hours of NASA Content	Min. 20 Hours of NASA Content	Min. 6 Hours of NASA Content
Total Hours of Annual School Year Engagement Per Student	Min 25 Hours of NASA Content	2 Activities	None, Short Duration , Summer Focused Events
Role Of Certified Teacher in Content Delivery	Delivers portion of Summer and School year content	Encouraged, Not Required	Encouraged, Not Required
Professional Development Offered for Teachers	40 Hours	8-24 Hour Workshops offered by Centers	4-8 Hour Workshops Offered by Sites
Total Teachers Involved	Over 1,200 (min. of 150 certified teachers per award)	1200	Variable (Est. 500)
School District Partnership	Required	Not Required	Not Required

List of 2011 Summer of Innovation Partners:

Table V: Summer of Innovation National Awardees – 2011

National Awardees	
Chester County Intermediate School District	Puerto Rico Institute of Robotics, Inc.
Albany State University	Rio Grande Valley Science Association
Nebraska Department of Education	Indiana Association of United Ways, Inc.
Dorothy Jemison Foundation for Excellence	South Dakota Discovery Center and Aquarium

Table VI: Summer of Innovation Center Partners – 2011

Center Partners	
Ames Research Center	
Rock-It Science	Roundhouse Council

University of California, Summer Algebra Academy	Morgan Hill Unified School District
California Alliance of African-American Educators	East Side Union High School District
Foothill Indian Education Alliance	Oak Grove Union District
American Indian Education Program	Franklin McKinley School District
Berryessa Union School District	Campbell Union School District
Mathematics, Engineering, Science Achievement (MESA)	
Dryden Flight Research Center	
Challenger Learning Center	Luke Air Force Base
California State University Bakersfield	Lamont School District
Standard Elementary School District	Arizona State University
City of Palmdale	National Defense Education Program
Air Force Research Lab	Model-it! STEM Summer College for Kids
Columbia Memorial Space Center	Downey Unified School District
ISTE	California State University Long Beach
Los Angeles County Office of Education	Orange County Office of Education
Mathematics, Engineering, Science Achievement (MESA)	
Antelope Valley - Math, Science, Engineering and Technology Advisory Board	
Fulton Schools of Engineering and the School of Earth and Space Exploration	
Glenn Research Center	
Cincinnati Public Schools	Douglas and Maria DeVos Foundation
Ohio River Way	Cuyahoga Community College
Cleveland Metropolitan School District	Great Lakes Science Center
Perkins Local School District	Sandusky City Schools
Minneapolis Public Schools	Cargill Foundation
ADC Foundation	Bakken Museum
Lockheed Martin	Augsburg College
University of Minnesota	Washburn High School
Goddard Space Flight Center	
District of Columbia Public Schools	Baltimore City Schools
District of Columbia Public Charter Schools	Prince George County Schools
Baltimore County Schools	Howard County STEM Business Education Coalition
Jet Propulsion Laboratory	
All People's Christian Center	California State University Northridge
Foshay Learning Center	Great Minds in STEM
San Diego County Office of Education	Santa Ana Unified School District
Los Angeles County Office of Education	LA's BEST
California State University Los Angeles	Think Together
Los Angeles Department of Parks and Recreation	Alpha Center at the University of California, Riverside
Los Angeles Trade Technical College 21st Century Summer Program	
Johnson Space Center	
Clear Creek Independent School District	Dickinson Independent School District
Galena Park Independent School District	Galveston Independent School District
Houston Independent School District	HoustonWorks
Krueger School of Applied Technologies	Gadsden Independent School District
New Mexico State University	
Kennedy Space Center	
Bethune Cookman Explorers Program	Orange County Public School
Fernbank Science Center	St. Croix Department of Education
Mathematical Engineering Science Academy (MESA)	Miami-Dade County Public Schools
Florida Memorial University	Black Pilots of America Association
Integrated Learning Trust	WPBT Channel 2
Girls Get IT!	Disney
Langley Research Center	
From One Hand to Another	Big Brothers, Big Sisters
Virginia Air and Space Museum	Salvation Army
Newport News Public Schools	Hampton Public Schools
Newport News 21st Century Learning Center	Project Positeen

South Carolina Space Grant	Crittenden Middle School
Orangeburg Consolidated School District 5	Accomack County Migrant Education Programs
North Carolina Migrant Education Programs	Virginia Migrant Education Program
Marshall Space Flight Center	
Alabama 4-H	Auburn University
Troy University	Dothan City Schools
Louisiana Tech University IDEA Place	LA GEAR UP
The Institute for Micromanufacturing	Girls Incorporated
Huntsville Housing Authority	Girl Scouts of North Central Alabama
U.S. Army Morale, Welfare and Recreation Center	Huntsville/Madison County Libraries
Lorain County Joint Vocational School	Metro Nashville Public Schools
Lebanon Special School District	University of Arkansas
Bernard Harris Foundation	Iowa Children's Museum
Stennis Space Center	
Mississippi 4-H	Boys and Girls Clubs of the Gulf Coast
Mississippi State University Extension Services	Gulfport High School Technology Center
Picayune Memorial High School	St. Patrick's High School
Hammond High School	Warren Central High School
Northshore High School	Oak Grove High School
Mississippi State University	Jackson State University
Southern University	Bernard Harris Foundation
Louisiana State University	St. Tammany Parish Schools
Louisiana Department of Education	

Table VII: Summer of Innovation Mini-Grants – 2011

Mini-Grant Awardees	
Sciencenter Discovery Museum	Museum of Natural History and Planetarium
Headwaters Science Center	Evergreen Aviation & Space Museum
Discovery Center Museum of Rockford, Inc.	The Works
Long Island Science Center	Upper Dublin School District Planetarium
Virginia Air & Space Center	Discovery Museum Science and Space Center
Reuben H. Fleet Science Center	Discovery Museum and Planetarium
Seaborg Mathematics & Science Center	McAuliffe-Shepard Discovery Center
The Cradle of Aviation Museum	Middletown Public Schools/Krupowicz Planetarium
Don Harrington Discovery Center	MathScience Innovation Center
The Anchorage Museum at Rasmuson Center	SciTech Museum
Kansas Cosmosphere and Space Center	Challenger Learning Center of Maine
International Space Hall of Fame Foundation	Kopernik Observatory & Science Center
ScienceSouth, Inc.	Lafayette Library and Learning Center Foundation
Evergreen Aviation & Space Museum	The Imaginarium of South Texas
Science and Discovery Center of Northwest Florida	Clark Planetarium
Challenger Learning Center-St. Louis	Saint Louis Science Center
The Space Museum	Carnegie Science Center
iWorlds Space Center	Wings of Eagles Science Academy
Delaware AeroSpace Education Foundation (DASEF)	Haverhill Robotics
G Works Inc.	Dr. Nelson Ying Tri Region Science and Engineering Fair
Future of Flight Foundation	San Diego Space Society
Jesuit Middle School (partnering with Creighton University)	Boys and Girls Club of Fairbanks
Boys and Girls Club of Malibu Teen Center	Colorado State University - Adams County 4-H
Meriden YMCA	'When Robots Fly' Robotics Team
Children & Charity International	YELL! Academy: Youth Engaged in Learning and Leading
Center for Sustainable Communities	Dr. D.T. Walton Jr. Omega Foundation, Inc.
Heart to Hart Learning	Boy Scout Troop # 4, ITCOM (In The Company of Men)
Ida County Economic Development	XSTREME Learning Foundation
Sci-Port: Louisiana's Science Center	Innovative STEM Foundation (ISF)
Mid-Atlantic Institute for Space and Technology (MIST)	Island Astronomy Institute
Boy Scout Troop 334	Girl Scouts of Michigan Shore to Shore (GSMISTS)

B.H.A.L.D.I. (Balloon-based, High-Altitude Digital Imagery)	Field GEMS
YWCA Middle Rio Grande	Massena Robotics Club
iSPACE, Inc.	Boys and Girls Club of Cleveland
S.T.E.P.S.- Students Taking Excellence Personally = Success	Sisters of Nia Girls' Summer Enrichment Program
Friends of Saturday Academy	NASTAR Foundation
Children's Center for Treatment & Education	South Dakota Robotics Association
Remnant Fellowship Summer Camp	Girlstart
Girl Scout Council of Colonial Coast	Jubilee Family Development Center
BioPharmaceutical Technology Center Institute	Near Earth Object Foundation
Tyler County Girl Scouts Troop 5977	Laramie County Community Partnership
San Diego Science Alliance	Dakota County 4-H
Coatesville Community Education Foundation	Colonial Seaport Foundation
Girl Scouts of North-Central Alabama	Mount Airy in Action
Conway Middle School	Global Engineering Math and Science Explorers
Kauai Robotics Alliance	Bolivar County Extension Services- 4H Robotics
FIRST Robotics Team 433 - The Firebirds	PhillyBotShop
FIRST Robotics team, EnTech 281	National Society of Black Engineers - TSU Chapter
Girl Scouts of the Commonwealth of Virginia	Boy Scout Troop 40
Boy Scouts of America Troop 179	Cub Scout Pack 212
Girl Scouts of Virginia Skyline Council	Pittsylvania County 4-H
DIGIVATIONS INSTITUTE	HSCSD #1 Lights On Afterschool
Haili Christian School	Astronomical Society of the Pacific
The Jefferson School	Daarul Uloom
The Stanley Clark School	Al-Ihsan Academy
Apollo Middle School	Bayside Middle School: Virginia Beach City Public Schools
Newington Forest Elementary School	Hephzibah Middle School
Langston Chapel Middle School Lego League Robotics Club	Stephenson High School
TSA Cedar Grove Middle School Dekalb County Schools	Wahiawa Middle School Robotics Team
Waianae High School	Burley Junior High School Science Club
STEM Academy	Edward Bellamy Middle School
Design Engineering Club C/o Buck Lodge Middle School	Battle Creek Middle School
Washington Technology Magnet School	Trout Creek RoboManiacs
Piedmont Community Charter School	Jim Bridger Middle School Clark County School District
Michael R. White STEM School	White River Middle School
Chattanooga Girls Leadership Academy	Vintage Math Science Technology Magnet School
Johnston Middle School-Space Explorers Club	Martin Middle School Student Council
Mission Bend Elementary School - Robotics Club	Wiley Middle School
Beville Middle School Robotics Team	Tully Central School District
Shelburne Community School	Robotics Team of Follansbee Middle School
Providence Creek Academy Charter School	Watauga Middle School
Daniel Morgan Middle School	Lylburn Downing Middle School Science Club
Rex Mill Middle School	Austin Middle School
Donna High School	Munoz Elementary
McNeil Canyon Elementary School	Pencader Charter High School
Technology Student Association	Nebo Science Club
Brown Middle School	Marion C. Seltzer School
Greenwood Middle/High School	CMS Girls STEM Club
Austin Middle School	Curington Elementary
D. U. Buckner	Munoz Elementary
Edith and Ethel Carman School	Key Peninsula Middle School
STEM Career Club	Midwestern Intermediate Unit IV
Mad About STEM- Spotsylvania County Schools	Mitchell Public Schools
South Union Community Development Corporation	Las Vegas Summer Robotics Camp
Dinwiddie County Public Schools	Chinle Unified School District
Fort Payne City Schools Extended Day Program	Redfield LEGO SET Committee
Columbia Basin College	Yuma County Extension Office
Bismarck State College	Louisiana Art & Science Museum

Upper Merion Area Middle School Technology Student Association
The DuMond Conservancy for Primates and Tropical Forests, Inc.
Buffalo Society of Natural Sciences (aka Buffalo Museum of Science)
Boy Scouts of America, Golden Empire Council, Sacramento
Mauro-Sheridan Magnet School for Technology, Science and Communications
After School Science Program at Graham Junior High School
Business, Engineering, Service, and Technology (BEST) Mentoring Program
Juneau Economic Development Council/SpringBoard STEM Program
Cincinnati Alumnae Chapter of Delta Sigma Theta Sorority, Inc.
After School Science Program at Graham Junior High School